

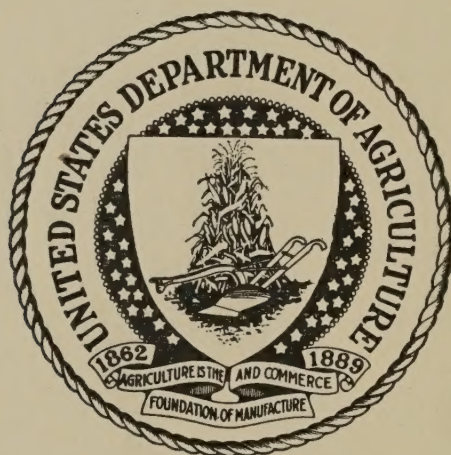
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U.S. BUREAU OF PUBLIC ROADS.

Report on traffic conditions.

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REPORT ON TRAFFIC CONDITIONS

LETTER

FROM

THE SECRETARY OF AGRICULTURE

TRANSMITTING

PURSUANT TO LAW, A PRELIMINARY REPORT ON AN INVESTIGATION OF TRAFFIC CONDITIONS AND MEASURES FOR THEIR IMPROVEMENT

MARCH 29, 1937.—Referred to the Committee on Post Offices and Post Roads

MARCH 29 (calendar day, APRIL 1), 1937.—Ordered to be printed

DEPARTMENT OF AGRICULTURE,
Washington, March 23, 1937.

Hon. JOHN N. GARNER,
President of the United States Senate.

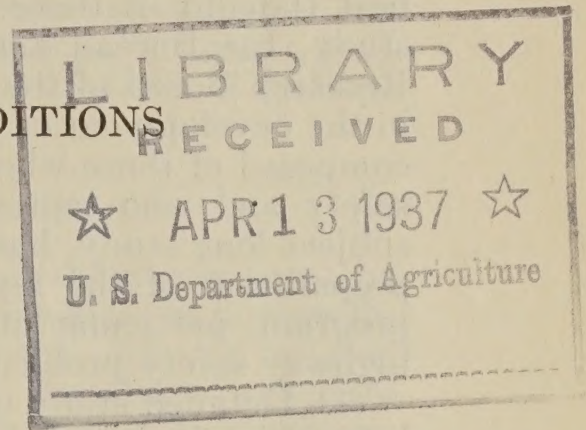
DEAR SIR: As directed in section 2 of an act to authorize the Secretary of Agriculture to investigate and report on traffic conditions with recommendation for creative legislation (Public, No. 768, 74th Cong.) I am transmitting herewith a preliminary report of the results of the above study and research and of the studies of uniform motor-vehicle laws throughout the country.

Very truly yours,

H. A. WALLACE, *Secretary.*

PRELIMINARY REPORT TO CONGRESS ON STUDY AND RESEARCH OF
TRAFFIC CONDITIONS AND MEASURES FOR THEIR IMPROVEMENT,
MARCH 23, 1937

Under authority of the act approved June 23, 1936 (Public, No. 768, 74th Cong.), the Bureau of Public Roads is engaged on a series of research projects in highway safety. Under the terms of the act the Bureau is required to submit a preliminary report in March and a subsequent report in June 1937. Traffic accidents and fatalities have



reached proportions that place them in the front rank of critical national problems. They involve not one but a whole series of causes and conditions which, to be remedied, must first be understood.

For the purpose of bringing to bear upon the different problems the best thought of those who have been giving them long and careful study, the Bureau has arranged for cooperation with the Highway Research Board of the National Research Council and other agencies in the development of the required reports. An Advisory Committee composed of those who are nationally recognized in the field of traffic safety and who represent organizations that have been giving the subject long study, has been requested to act with the Bureau in the preparation of the reports and recommendations. In the research program, particular attention is being given to three phases of the highway safety problem:

- (1) Detailed study of the lack of uniformity of State motor-vehicle laws which is regarded as an important contributing cause of highway accidents.

- (2) Study of the characteristics and habits of drivers, including the identification of dangerous drivers.

- (3) Improvement of the basic data, particularly accident reporting needed for the study of accident causes and prevention.

Detailed investigations in this field are organized and are being carried on by the Bureau and through cooperation with the Highway Research Board.

This is submitted as a progress report and the subjects touched upon will be further supported by authentic data which are now being gathered.

DRIVER RESEARCH

ACCIDENT REPEATERS

It is definitely known from experience in the general field of safety work and from studies of drivers in industrial fleets that certain persons have many times the normal frequency of mishaps while driving motor vehicles. Quite often it is impossible to show definitely that such a one is responsible for a particular accident, but for some reason he has the unhappy faculty of being on hand when such things happen.

It is also known that there are certain drivers who by reason of reckless actions and disregard of others' rights create situations in traffic that are hazardous to themselves and others.

In view of the fact that the accident expectancy of an average driver is one in 25 to 40 years, depending upon the definition for "accident", those drivers who have several accidents in one or two years must constitute a serious hazard if there is any important number of them.

PREVALENCE OF HIGH-ACCIDENT DRIVERS

That there are high-accident drivers is the only definitely known fact concerning them insofar as their presence in the general driving public is concerned.

The percentage of such drivers is not known.

It is not known in what proportion of the total accidents they are involved.

Information on these two points is necessary in order to appraise the relative importance of this factor in the highway safety situation, and to devise effective measures for its control.

In order to discover the facts of this situation, a statistical study is being made of the accident records of a large number of drivers in the general population of a State in which the records are properly kept and available. This project was proposed by the Division of Anthropology and Psychology of the National Research Council.

IDENTIFICATION OF HIGH-ACCIDENT DRIVERS

If accident proneness is an important factor, some means must be found of identifying the individuals having trouble-making potentialities before the accidents happen. Some, of course, may be isolated by study of accident records in jurisdictions that have adequate reporting methods, but that will only partially solve the problem, because many new drivers are coming on the roads continually, and the accident-prone among them should be recognized before their damage is done.

Tests of individuals have been developed, notably by Alvah R. Lauer, of Iowa State College, and Harry R. DeSilva, of the Harvard Bureau for Street Traffic Research, to such a point that it is possible to determine a person's relation to the average for a number of traits that presumably should have some influence on his ability to drive a motor vehicle safely. In theory, the quality of a person's ability with respect to hearing, seeing, resistance to glare, angle of vision, reaction time, coordination, color vision, physique, and intelligence should indicate his potential ability as a driver. Although many good uses can be made of such tests in examining applicants for drivers' licenses and in investigation of individual cases of known bad driving, still it has not yet been found possible by this means to identify in advance persons who are likely to have accidents or who, in traffic, habitually cause hazardous situations.

In order to evaluate the driver tests that have been developed thus far and determine their practical application, these tests are being correlated with driving results by study of the test results on a large number of individuals comprising drivers both of known high-accident record and of known freedom from accidents.

BASIC DATA

FUNDAMENTAL CAUSES OF ACCIDENTS

In addition to the projects dealing solely with the driver, two others are in progress from which it is hoped significant factors relating to fundamental causes of accidents will be revealed.

Many factors are involved in highway traffic accidents and only to a limited extent has it been possible to segregate and study them individually. If a large number of major accidents are studied in detail, it seems reasonable to expect that some factors may stand out as fundamental causes of accidents, and virtues and defects in present methods of reporting, recording, and control may become apparent. Until the fundamental causes are defined, we will continue to work in the dark in attempting to apply corrective measures.

Two approaches to this type of investigation are in progress.

Under a project of the traffic department of the Highway Research Board, of which Prof. C. J. Tilden, of Yale University, is chairman, the collection of the case histories of fatal highway accidents as revealed by accident reports and court records has been started.

Another method of attack is by means of technical and scientific study of accidents when they happen. In a number of city police departments, trained "accident squads" have been organized, to go to the scene of each accident immediately and to investigate all its circumstances. A few accidents have been analyzed from a mechanical engineering viewpoint by scientists of the National Bureau of Standards. Since the testimony of participants and eyewitnesses is known to be unreliable the cold appraisal of the facts by competent observers and technologists should offer the best means of accumulating authentic case histories.

ACCIDENT REPORTS AND RECORDS

A third type of project is included for the purpose of looking into the present availability of basic data for the study of highway accidents with the objective of developing recommendations for the improvement of accident reporting and recording. This involves studies of the State laws relating to accident reporting and highway patrols; reporting and recording methods; administration, duties, and adequacy of highway patrols; and effectiveness of law enforcement.

ADVISORY COMMITTEE

In order to secure the benefit of the best thought in the Nation on the problem under investigation, an advisory committee has been formed. It is composed of men of wide experience and knowledge in this field of research and representatives of agencies which are vitally interested and whose cooperation is being freely given.

The advisory committee was most helpful in the formulative stages of the undertaking and it is expected that the advice of these men will be invaluable in appraising the results. The members are:

Dr. H. C. Dickinson, National Bureau of Standards, chairman of the Highway Research Board.

Prof. C. J. Tilden, Yale University.

Dr. Alvah R. Lauer, Iowa State College.

Dr. Harry R. DeSilva, Harvard Bureau for Street Traffic Research.

Prof. Robbins B. Stoeckel, Yale University.

Mr. Sidney J. Williams, National Safety Council.

Mr. Burton W. Marsh, American Automobile Association.

Mr. L. W. McIntyre, American Motorists' Association.

Dr. Ralph Lee, Automobile Manufacturers' Association.

Col. A. B. Barber, Chamber of Commerce of the United States.

Mr. Donald Blanchard, Society of Automotive Engineers.

Mr. A. W. Whitney, National Bureau of Casualty and Surety Underwriters.

Mr. John Q. Rhodes, Jr., American Association of Motor Vehicle Administrators.

For the Bureau of Public Roads the research program is under the general direction of Mr. E. W. James, Chief of the Division of Highway Transport, assisted by Mr. William G. Eliot, 3d, highway economist. For the Highway Research Board Mr. Roy W. Crum, Director, is in

charge, assisted by Dr. H. M. Johnson, research associate. In addition to the organizations represented on the advisory committee, there are a number of other agencies whose cooperation is acknowledged, particularly the Division of Anthropology and Psychology of the National Research Council, the Connecticut Department of Motor Vehicles, the Michigan State Police, and the International Association of Chiefs of Police.

PROJECTS

As the projects are all in the information-gathering stage it is not possible to give any results of the work at this time. A description of each project and its present status follows:

DIGEST AND CORRELATION OF EXISTING INFORMATION ON DRIVER RESEARCH

The object of this project is to reinforce the investigations relating to drivers by bringing together the information already available so that other evidence and points that may not be covered by the present research may be studied.

A list of titles and abstracts is being compiled of published articles which purport to present the results of research: (1) One means of detecting those personal traits which predispose the individual driver to accidents in general and to accidents of specific types; (2) on means of controlling the individuals who have these predisposing traits; and (3) on personal traits which appear to contribute to individual accidents.

Toward this end the psychological and physiological journals published in English, French, and German are being searched. Advantage is being taken also of the catalogs of titles and abstracts of articles on highway safety which have been made available by the American Automobile Association and the National Safety Council.

It is reasonably expected that within the period of the appropriation a list of available articles will be prepared which will approximate completion.

Early in this study it developed that the findings reported in some of the more important articles, if regarded superficially, appeared to be incompatible with those reported in other articles, and that a careful analysis of assumptions, of criteria, of methods of collecting data, and of statistical treatment, would be necessary to reduce the findings to a common basis of discussion. This treatment is being applied as far as is practicable under the time limitations of the grant; the result should be a digest which will permit critical evaluation of the most important work that has been done to date.

STUDY OF ACCIDENT RECORDS OF DRIVERS

The purposes of this project are: (1) To ascertain the relative number of high-accident drivers in the general population and the percentage of accidents that is attributable to this group, and (2) to determine whether the history of accidents, law violations, and complaints against an individual driver collected by the State licensing authorities affords a basis for predicting his future performance.

The records of the State of Connecticut have been selected for study. From the list of approximately 400,000 drivers who were

relicensed in 1932 (and who therefore were licensed in 1931) every tenth name is being selected. Those individuals are then eliminated who have not been licensed during all the years from 1931 through 1936. This leaves a group of approximately 25,000 drivers. Their records of accidents, law violations, etc., are being compiled from the files of the commissioner of motor vehicles. The results should show whether such records as the State collects can be made useful to the licensing authorities in determining, in doubtful cases, whether a given driver should be relicensed or not, and should indicate the relative importance of the high-accident driver in the highway-accident situation.

The data should also be of value in studying recommendations for uniform methods of record keeping.

TESTS OF DRIVERS OF KNOWN ACCIDENT AND NONACCIDENT HISTORY

The physical and psychological tests of motor-vehicle drivers that have been devised in the last decade to measure skills which are assumed to be demanded in safe driving have been developed from two points of view. One is educational. If a subject's attention can be called to certain traits in which he is below the average and which presumably affect his ability as a driver, he may be enabled to improve his skill or to learn how to compensate for certain deficiencies and thus become potentially, at least, a better driver.

The other point of view is the more practical one of attempting by test of individuals to determine whether or not they are safe drivers. The present investigation is concerned with this latter phase of the subject, although there is an interesting possibility at some future time of checking the educational results by going over the records of the individual drivers subsequent to the tests.

The purpose of this particular investigation is to correlate the tests with the accident records of individual drivers, with a view to determining the value of such tests as an aid to the authorities in issuing, suspending, and revoking driver permits.

The objectives of this investigation are outlined in the following statement that was approved by the advisory committee at its meeting on October 10, 1936:

One of the major projects in this program is to secure full information on the excellent work now going on in the field of driver research for the purpose of accident prevention.

A part of this project is the testing of drivers who have had more accidents than the average person. This is for the purpose of determining whether there are characteristics which can be discovered common to these "high-accident" individuals and not to the accident-free.

Research related to this subject has been going on for many years under the direction of Dr. Alvhh R. Lauer, of Iowa State College; Dr. Harry R. De Silva, of the Harvard Bureau for Street Traffic Research; Mr. J. Stannard Baker, of the National Safety Council; and others.

As members of the advisory committee of the Highway Research Board, which is carrying on this program cooperatively with the United States Bureau of Public Roads, these investigators point out that while much progress had been made in testing drivers, the technique is far from perfect.

To illustrate, in their work certain apparatus has been developed which they compare to the instruments used by the medical profession for the measurement of bodily temperature, blood pressure, and respiration. The committee (meeting Oct. 10, 1936) pointed out that just as in the use of these medical instruments, so does the value of the driver-testing apparatus lie in the correct interpretation of the results achieved in its use.

Warning that "some people are under the impression that the instruments alone can be used to determine how good or how safe the individual is as a driver", the committee went on record that no such conclusions are warranted. They pointed out that many other factors enter into driving safety, such as the personality of the driver and his attitude toward other drivers and the public in general, his knowledge of traffic laws, his knowledge of his vehicle, and his experience and training in driving.

It is not known yet whether "this equipment alone in its present state of development can be used to predict whether any individual is or is not a safe driver", they stated.

As yet the published records have not clearly shown that these tests are determinative in predicting the performance of the driver. In the meantime, it would seem premature to exploit them for this purpose. With the cooperation of Iowa State College and the Harvard Bureau for Street Traffic Research, equipment has been assembled at Hartford, Conn., for making the principal tests which have been developed by prominent psychologists and personnel administrators in America.

With the cooperation of Col. Michael A. Connor, Commissioner of Motor Vehicles, some 3,000 subjects by the end of March will have been subjected to each of 65 tests. The group of subjects includes a fair proportion of accident-free and accident-labile individuals whose driving histories are on file in the Commissioner's records. Analysis of these records and corresponding tests should indicate:

1. Whether any of these tests, or any combination of them, will identify persons who are prone to have accidents or cause hazards in traffic.

2. Whether any of these tests, or any combination of them, are useful in predicting the number of accidents which the individual most probably will have within a given period.

3. Whether any of these tests, or any combination of them, show whether the individual is predisposed to any particular type of accident.

ANALYSIS OF RECORDS OF SERIOUS ACCIDENTS

By study of a large number of case histories of serious accidents information should be disclosed on—

1. Fundamental factors involved in highway accidents.
2. Methods for improving underlying conditions that contribute to highway accidents.
3. Needed regulatory and enforcement arrangements.

The procedure under this project is to get complete information in detail on as many cases as possible in States or cities where accident investigations are adequate and complete records are kept. Reference is made to the accident reports, newspaper accounts, court records and any other authentic information that can be secured. It is expected that about 2,000 cases in all will be available for study.

Up to March 1, 1937, reports of 788 accidents involving 856 fatalities had been collected in Massachusetts, Rhode Island, Connecticut, New Jersey, New York, and Pennsylvania. In general, these include only accidents occurring in 1936, with a view to obtaining as far as possible a cross section of the year's accidents in each State in which data are collected.

The usual method of accounting for an accident, namely, selecting from a complex of contributing factors a single one which is arbitrarily

assigned as the "proximate cause", is not very informative. A proper understanding of any accident requires that a group of factors be evaluated. On this account the recorded description of each accident will include mention of every factor that appears to have significance, including such items as weather, lighting, conditions of operators, driving faults, and the results of the accident in terms of death, injury, or property damage.

The analysis of such a large number of case histories involves considerable difficulty as obviously no one investigator can bear in mind the salient points of such a large number of individual histories at once. Tabulation and analysis of the data will therefore be accomplished mechanically. The number of possible combinations of circumstances is so great that it is proposed to assume certain "clusters" of contributing factors and to ascertain whether or not these "clusters" occur more frequently than chance requires. For adequacy, a large number of such patterns will have to be tested.

INVESTIGATION AT THE SCENE OF THE ACCIDENT

This project was set up to study the feasibility of rural accident investigation by trained police officers on a State-wide scale, and to develop improved procedure in the preparation, analysis, and use of accident data for accident prevention. The Bureau of Public Roads, the Highway Research Board, the Michigan State police, the International Association of Chiefs of Police, and the Michigan State Highway Department are cooperating in establishing an accident prevention bureau at the State police headquarters in East Lansing, Mich.

Investigation of accidents by trained police squads immediately at the scene of their occurrence has proved its value in many cities. No similar organization has heretofore been attempted for the reporting of rural accidents, primarily because of the obstacles inherent in large road mileage, long distances, and inadequate communication facilities. The program of research under the present project includes the intensive, on-the-spot investigation of accidents by technical observers in one or more selected rural areas in the State of Michigan, and the training of the entire uniformed police force to improve the reporting of accidents witnessed or investigated by them. Assistance is also being given in the development of report forms and methods for subsequent analysis and use of accident data.

SURVEY OF STATE ACCIDENT REPORTING

This research project contemplates a study of State laws, regulations, and practices relating to the reporting of motor-vehicle accidents, and the use made of accident data. It involves a personal visit to nearly every State for the purpose of observing first-hand the practices which are followed by motor vehicle, State police, and State highway patrol departments in reporting traffic accidents and in using the reports, and the data obtained from them, to lessen traffic hazards and reduce the number of accidents. The project includes the following major specific studies:

1. Legal requirements for reporting traffic accidents, and their comparison with the provisions of the Uniform Vehicle Code as

recommended by the National Conference on Street and Highway Safety.

2. Practices pursued in stimulating and encouraging more complete and accurate reporting of accidents. This also includes following up on delinquent reporters, and checking with other agencies directly or indirectly concerned with traffic accidents.

3. Procedure in handling accident reports, from the time the report is received until the case is closed and the report filed. This includes cross-referencing, determining "repeaters", citing for hearing for suspension or revocation of driving licenses, and tabulating the information and data contained in the reports.

4. Filing system.

5. Uses made of accident data and the filed reports, for education, enforcement, and engineering.

It is intended that the project culminate in a report outlining the best practices in the different phases of traffic-accident reporting and uses of accident data and records observed in the different States. The report will include specific recommendations, based largely on experience, for practices leading to more complete and accurate reporting of traffic accidents, and greater and more effective use of accident facts in making streets and highways safer, and for more uniform reporting of accident statistics among the States, at least to provide for uniform reporting of a certain minimum amount of basic and desirable accident data.

Conferences have been had with specialists and interested persons in such organizations actively engaged in traffic safety work as the American Association of Motor Vehicle Administrators, National Safety Council, Harvard Bureau for Street Traffic Research, American Automobile Association, National Bureau of Casualty and Surety Underwriters, Bureau of Motor Carriers of the Interstate Commerce Commission, International Association of Chiefs of Police, and the Travelers Insurance Co.

Up to March 23, 1937 the traffic accident reporting systems of motor vehicle and State police departments, highway patrols, and highway departments in 26 States have been carefully studied in considerable detail. Present plans include visits to at least 13 additional States. If time permits, others will be included, making the project as nearly as possible complete and Nation-wide in scope.

UNIFORM MOTOR VEHICLE LEGISLATION

The act of Congress also requires a report on the status of uniform motor-vehicle traffic laws throughout the country. Under the direction of Mr. L. E. Boykin, Chief of the Division of Highway Laws and Contracts, of the Bureau of Public Roads, the motor-vehicle laws of all the States and of the District of Columbia are being studied in detail to determine the extent to which uniformity exists.



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